ABSTRACT

An apparatus and method to deposit a MgO film on a large substrate area. The method includes applying a voltage to one or more magnesium targets; applying an electric current to the one or more magnesium targets when the voltage stops increasing so that a power with a negative square wave, which does not cause mutual interfere, is applied to the one or more magnesium targets; and forming a MgO film on a substrate using magnesium particles emitted from the one or more magnesium targets by the power applied. The disclosed apparatus to deposit a MgO film on a large substrate area includes a magnetron part having at least one magnesium target and a permanent magnet; a power control part to apply power to the at least one magnesium target and separately provide control for each of the at least one magnesium target; a flow control part to supply gases for the at least one magnesium target; a substrate control part to control a substrate; a vacuum control part to control a vacuum state in a chamber; and a heater control part to maintain temperature in the chamber.